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Review article

Health risks and outcomes that disproportionately affect women during the Covid-19 pandemic: A review

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ABSTRACT

Background: The Covid-19 pandemic is straining healthcare systems in the US and globally, which has wide-reaching implications for health. Women experience unique health risks and outcomes influenced by their gender, and this narrative review aims to outline how these differences are exacerbated in the Covid-19 pandemic.

Observations: It has been well described that men suffer from greater morbidity and mortality once infected with SARS-CoV-2. This review analyzed the health, economic, and social systems that result in gender-based differences in the areas healthcare workforce, reproductive health, drug development, gender-based violence, and mental health during the Covid-19 pandemic. The increased risk of certain negative health outcomes and reduced healthcare access experienced by many women are typically exacerbated during pandemics. We assess data from previous disease outbreaks coupled with literature from the Covid-19 pandemic to examine the impact of gender on women's SARS-CoV-2 exposure and disease risks and overall health status during the Covid-19 pandemic.

Conclusions: Gender differences in health risks and implications are likely to be expanded during the Covid-19 pandemic. Efforts to foster equity in health, social, and economic systems during and in the aftermath of Covid-19 may mitigate the inequitable risks posed by pandemics and other times of healthcare stress.

1. Introduction

Pandemics, as we are learning from the Covid-19 outbreak, can infect and sicken societal institutions and systems just as effectively as the virus weakens its organic host. Much as the SARS-CoV-2 virus confers disproportionate morbidity to individuals on the periphery of health—the elderly and those with chronic medical conditions—the societal effects of the pandemic disproportionately impact marginalized populations. As the Covid-19 crisis exacerbates system-level deficits, disparities in disease risk and outcomes are widening for vulnerable populations.

Gender is a social determinant of health, unique from but entangled with sex differences (Springer et al., 2012; Rich-Edwards et al., 2018), and an axis along which the Covid-19 pandemic is widening health disparities. Outside of the pandemic, women on average report more physical and mental unhealthy days per year than men despite utilizing more preventive care services (Centers for Disease Control and Prevention [CDC], 2013). Women also have worse outcomes for prevalent health conditions including asthma (CDC, 2013), diabetes (Roche and Wang, 2013), and myocardial infarctions (Mehta et al., 2016). These health inequities are compounded in women with intersecting identities such as non-white race, low socioeconomic status (SES), immigrant status, lower education, older age, rural geographic location, disability, and LGBTQIA identity.

Initial reports indicate that women are at decreased risk of severe disease and death with SARS-CoV-2 infection than men (Purdie et al., 2020; Richardson et al., 2020). However, discussions about Covid-19's health effects must include the unique circumstances that make women vulnerable to the structural dysfunction impacting their health status. In this review, we use evidence from past global disease outbreaks and the current understanding of the Covid-19 pandemic to highlight the pandemic-related challenges present for women, particularly women in

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the United States (US), associated with healthcare workforce capacity, reproductive health, drug development, intimate partner violence (IPV), and mental health. Our discussion is centered around those issues that have direct impacts on clinical care both during and in the aftermath of this pandemic. Social determinants of health—including economic, sociopolitical, cultural factors—affect each of these topics, and where possible, we have included discussions of these issues from an intersectional lens (Crenshaw, 1989). Moreover, we note that the impact of multiple overlaid identities on health outcomes are not simply additive, but uniquely interactive (Hankivsky, 2012). We recognize that gender encompasses a spectrum of non-binary identities including transgender and gender-diverse individuals, and these groups are subject to unique disparities that this pandemic has the potential to exacerbate (Daniel and Butkus, 2015). However, this review predominantly explores issues related to people who identify as women. The gender disparities outlined here demonstrate the need for deliberate action to foundationally address these issues at baseline and mitigate their amplification during pandemics. We conclude by recommending interventions to promote a more gender-equitable paradigm during and after disease outbreaks.

2. Caregiver workforce

Women compose the majority of the healthcare workforce; 76% of US healthcare workers are women (Fig. 1) (US Census Bureau, 2020). Reports from the CDC emphasize healthcare workers' increased risk of contracting SARS-CoV-2 given the close interaction with high concentrations of patients and visitors amidst shortages of personal protective equipment (PPE) (CDC, 2020a). Women are concentrated in roles requiring the most close, prolonged contact with patients (Fig. 1) (US Census Bureau, 2020).

The disproportionate economic impacts of the pandemic on women further exacerbate this risk. Eleven percent of women, compared to 4% of men, currently face underemployment (Center for Law and Social Policy, 2020). With increased job loss due to the pandemic (Nicola et al., 2020), many women are forced to work part-time in multiple healthcare facilities without paid sick leave, thereby increasing their risk of SARS-CoV-2 exposure and transmission to others (Pichler et al., 2020). Beyond this, although PPE is often marketed as "unisex," findings show that they are manufactured according to traditional male proportions (Trades Union Congress, 2017). This has led to some women wearing ill-fitting PPE, potentially compromising their degree of protection (Pugh, 2020). These gender-based occupational exposure risks must be addressed in workforce planning and in assessing risk for families as women return home after their shifts.

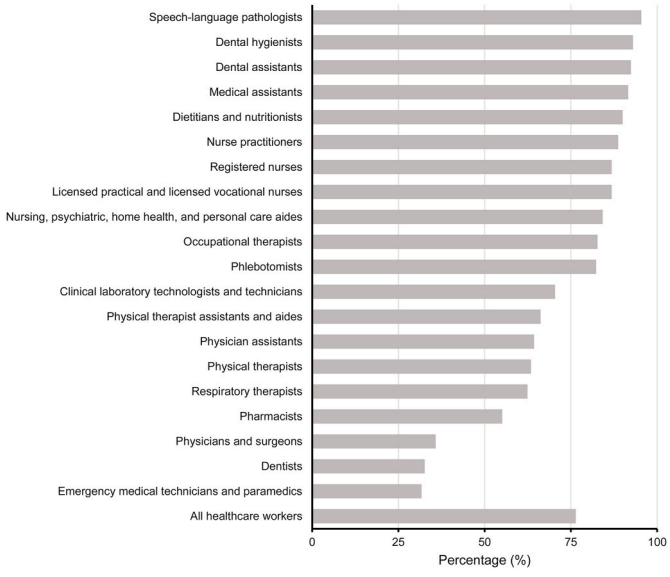

Fig. 1. Percent of women employees by healthcare occupation. Data from the 2018 American Community Survey from the US Census Bureau (US Census Bureau, 2020).

Outside of the healthcare workforce, women, particularly women of color and immigrants, constitute the majority of US domestic workers and caregivers that are paid outside of formal channels (Diaz-Ordaz, 2010). Although these workers play critical roles in the care of children, the sick, and the elderly, many legal protections afforded to formal caregivers (including health insurance, overtime pay, and paid leave) exclude domestic caregivers, especially those with undocumented status (Diaz-Ordaz, 2010). Moreover, Black and Latinx, low-income, and immigrant women are all at greatest risk of being uninsured (The Henry J. Kaiser Family Foundation [KFF], 2016) and subsequently being unable to access healthcare should they become sick from their caregiving roles. This sparse legal protection has been demonstrated to place workers in jobs that make them more vulnerable to SARS-CoV2 infection and prevent these workers from adhering to Covid-19 social distancing recommendations, accessing testing and treatment, and receiving economic relief from government programs (Page et al., 2020; KFF, 2020).

Beyond the paid workforce, 65% of informal family caregivers in the US are women (Feinberg et al., 2011). Roughly 87% of individuals with long-term care needs living in the community rely exclusively on unpaid caregivers for assistance (Kaye et al., 2010), making female informal caregivers a significant proportion of the caregiving workforce. Due to their personal caregiving responsibilities, working women lose roughly $5000 annually in income from wage penalties and reduced hours (Van Houtven et al., 2013). Conversely, male informal caregivers do not experience any difference in income for these responsibilities (Van Houtven et al., 2013).

Outside of disease outbreaks, female caregivers are more likely to experience a specific stress termed "caregiver burden," the multidimensional toll that caregivers experience to their social, emotional, spiritual, financial, and physical wellbeing (Adelman et al., 2014). Perceived lack of agency in choosing the role, financial stress, and social isolation are associated with higher caregiver burden (Adelman et al., 2014). The Covid-19 pandemic is already exacerbating women's caregiver responsibilities with schools and childcare centers preventatively closed nationwide in the US (Graves, 2020). The societal norms and structures dictating that women assume caregiving roles are augmented during disease outbreaks (Smith, 2019), limiting women's choice in becoming a caregiver. As a result, the tasks of daytime childcare fall disproportionately on women who may already be working formal jobs, maintaining their households, and fulfilling their original caregiving responsibilities. Consequently, it is likely that women are experiencing more caregiver burden during the pandemic while being isolated from the social supports needed to reduce this burden.

3. Reproductive healthcare

Pandemics limit access to the healthcare system, notably to preventative and reproductive healthcare. Evidence from prior pandemics and current experience reveal that obstetric care is particularly compromised. According to Ellington et al. (2020), pregnant women infected with SARS-CoV-2 are at greater risk for severe illness when compared to non-pregnant women with SARS-CoV-2, including increased risk of hospitalization (aRR = 5.4, 95% CI 5.1–5.6), intensive care unit admission (aRR = 1.5, 95% CI 1.2–1.8) and mechanical ventilation (aRR = 1.7, 95% CI 1.2–2.4). This study found no difference in death among pregnant and non-pregnant women. The reported medical vulnerability among pregnant people are likely due in part to physiological changes that occur during pregnancy and increased exposure risk due to clinical settings and procedures. However, this study was limited by missing data points among its participants including pregnancy status (missing for nearly 75% of participants) and medical comorbidities (missing in close to 80% of cases). More broadly,

differences in screening, testing, and indications for hospitalization for SARS-CoV-2 among pregnant and non-pregnant people may cloud the reported conclusions, and it is unclear if the increased risks seen among pregnant people are from obstetric or SARS-CoV-2 related complications (Ellington et al., 2020).

In an effort to mitigate SARS-CoV-2 infection, pregnant people have had their autonomy limited during this pandemic, including visitor restrictions during labor (CDC, 2020b), forced separation of SARS-CoV-2-positive mothers and infants (CDC, 2020b), and the potential for reduced options for anesthesia due to limited resources for respiratory support (Society for Obstetric Anesthesia and Perinatology, 2020). Additionally, there have been increased cesarean section rates among SARS-CoV-2 positive patients, which are often performed before term, increasing the risk of complications for both the mother and neonate (Della Gatta et al., 2020; Matar et al., 2020). These changes likely negatively impact maternal and neonatal outcomes (Elmir et al., 2010; Goodman et al., 2004). Outside of the current pandemic, the US's poor obstetric and neonatal healthcare indicators are largely driven by worse rates of maternal morbidity and mortality within Black and Native populations (Petersen et al., 2019). Racial disparities in access to and utilization of healthcare services and provider and institutional bias contribute to these outcomes, all of which may worsen during the health system stress of pandemics (Moaddab et al., 2018; American College of Obstetrics and Gynecologists [ACOG], 2015; Rosenthal and Lobel, 2011).

While reproductive healthcare is often reduced to obstetric medicine during pandemics (Smith, 2019), it is equally critical to ensure access to comprehensive family planning. A survey of US women indicates that since the inception of shelter-in-place restrictions in early 2020, women have experienced shifts in family planning preferences (i.e., wanting to delay or avoid pregnancy during the Covid-19 pandemic) (Lindberg et al., 2020). Despite the decreased desire to become pregnant, women have experienced logistical and political threats to contraception and abortion access during the Covid-19 pandemic. Shelter-in-place restrictions and decreased outpatient visits limit access to and anticipatory stockpiling of contraception. One-third of US women reported delays or cancellations in sexual and reproductive healthcare, with a higher proportion of reports from Black, Latinx, LGBTQIA, and low-income women. Women in these groups also report more concern about their ability to access sexual and reproductive healthcare services, particularly contraception (Lindberg et al., 2020). Despite this potential increase in unintended pregnancies and financial strain of the pandemic's economic fall-out, some states are threating to halt abortion services (Ollstein, 2020), inaccurately denoting these procedures as elective and able to be delayed (Smith et al., 2018; Watson, 2018; Bayefsky et al., 2020). In response, the American Medical Association (AMA) and ACOG have reaffirmed the authority of physicians to make decisions about essential healthcare in line with patient wellbeing and reproductive autonomy (AMA, 2020; ACOG, 2020a).

Abortion, chosen by nearly one million women annually in the US, affords many women and families improved health and economic status (Jones and Jerman, 2017). Abortions are time-sensitive procedures (Bayefsky et al., 2020; AMA, 2020). With each week of gestation, surgical complexity and risks increase, as does the amount of PPE, supplies, and clinic staff for each procedure. Since the majority of states impose upper gestational age limits on abortion procedures, delays will cause many women to "time-out," resulting in forced childbearing. Access to abortion is limited at baseline in the US, particularly for poor and rural-dwelling women (Jones and Jerman, 2017). Despite the challenges in access to family planning in a pandemic, medication abortion facilitated by telemedicine is prohibited in eighteen US states (Guttmacher Institute, 2020). Even if pregnant people obtain prescriptions for medication abortions, mifepristone—one of the drugs used—is subject to Risk Evaluation and Mitigation Strategy (REMS) restrictions (Mifeprex REMS Study Group, 2017). The REMS effectively bars the provision of mifepristone through retail pharmacies, and as a consequence people must go to clinics or hospitals to fill their prescriptions, putting them at higher risk for SARS-CoV-2 exposure and introducing another barrier to access. This issue led to a recent lawsuit against this Food and Drug Administration policy by ACOG, SisterSong Women of Color Reproductive Justice Collective, and other reproductive health groups (ACOG, 2020b). Continued restrictions on abortion will inevitably increase the number of pregnant people needing obstetric care during and in the aftermath of this pandemic, burdening an already under-resourced healthcare system.

4. Drug development

Women are underrepresented in drug development trials; many researchers fail to design studies with adequate samples of women, and even fewer analyze results according to gender and sex (Liu and Mager, 2016; Nowogrodzki, 2017). For example, women were excluded from all phases of development of a formulation of tenofovir alafenamide/emtricitabine for HIV pre-exposure prophylaxis. This drug has been approved by the Food and Drug Administration (FDA) for men only, despite the trial failing to meet FDA sex-specific standards (Goldstein and Walensky, 2019). Racial and ethnic minorities in the US are also vastly underrepresented in clinical research for structural and historical reasons, making non-white women rare demographics in studies (Rochon et al., 2004; Hussain-Gambles et al., 2004). The trend toward excluding women is likely to continue with trials for SARS-CoV-2 vaccines and treatment.

Furthermore, pregnant and lactating people are at increased risk of exclusion from clinical trials for SARS-CoV-2 medications. At baseline, pregnant and lactating people are systematically excluded from most drug and vaccine trials, given the risks of teratogenicity (Shields and Lyerly, 2013). Out of the over 2400 research studies studying SARS-CoV-2 registered on ClinicalTrials.gov as of July 2020, only 54 trials specify the inclusion of pregnant people (ClinicalTrials.gov, 2020). A review of industry-sponsored clinical trials suggests that researchers may overinterpret federal guidelines on exclusion criteria and make flawed assumptions about pregnant people's willingness to participate (Shields and Lyerly, 2013). This hinders patients and healthcare providers from making informed decisions about the efficacy and safety of medications and vaccines for use during pregnancy (Shields and Lyerly, 2013). Furthermore, most data on efficacy of drugs in pregnant people are gathered retrospectively from inadvertent exposures, which impose greater risk than that incurred during regulated research trials (Shields and Lyerly, 2013).

During previous disease outbreaks, like the 2019 Ebola outbreak, pregnant people's underrepresentation in clinical trials led to delays in delivering life-saving vaccines and treatments to this population (Rasmussen and Jamieson, 2019). Multiple candidate vaccines for SARS-CoV-2 are in the research pipeline (Lurie et al., 2020). However, if pregnant people are unduly excluded from these studies, this population may experience a similar lag in receiving vaccination or treatment during this pandemic. With the goal of equitable treatment access for women, researchers should implement frameworks to minimize the exclusion of pregnant people, such as the National Institute of Health's (NIH) tiered clinical trial design (NIH Grant and Funding, 2001), which deliberately confronts the medical and ethical complexity of enrolling pregnancy capable individuals in research studies.

5. Intimate partner and gender-based violence

Incidents of IPV and gender-based violence (GBV) increased globally during the Ebola (2014) and Zika (2016) outbreaks (Davies and Bennett, 2016) and are escalating during Covid-19 (North, 2020). Shelter-in-place restrictions socially and physically isolate families together. This, coupled with the mental and economic strains of the pandemic, is likely initiating and exacerbating IPV and GBV (Van Gelder et al., 2020). Due to these circumstances, it is estimated that 15 million

additional instances of GBV will occur globally every 3 months while shelter-in-place restrictions are in place (United Nations Population Fund, 2020).

Beyond its direct implications for physical and mental health, IPV is a social determinant of health and is associated with higher morbidity and mortality for co-occurring diseases (Miller and Mccaw, 2019). Within routine circumstances, interfacing with healthcare professionals serves as an important intervention to detect IPV; 37% of survivors of IPV who chose to disclose abuse told their healthcare provider (US Senate Committee on the Judiciary, 2009). A year-long study in a managed care setting demonstrated that healthcare providers trained to detect IPV made twice as many referrals to an on-site IPV evaluator as untrained providers (US Senate Committee on the Judiciary, 2009). Provider awareness of IPV screening and appropriate referral channels will be essential in patient care as shelter-in-place restrictions are lifted.

During the Covid-19 pandemic, resources for survivors are under increased strain due to the higher incidence of IPV (North, 2020; Townsend, 2020). One-third of women experiencing IPV reported difficulty accessing resources after these incidents due to the pandemic in a May 2020 survey (Lindberg et al., 2020). Additionally, the CEO of Young Women's Christian Association (YWCA) USA, the nation's largest provider of services and housing for IPV survivors, recently reported that most of the YWCA shelters nationwide were at or near capacity at the peak of the pandemic, especially in states that have felt the impact of Covid-19 for the longest period of time (North, 2020). Many of these densely-populated shelters have a high risk of viral transmission between residents. This has led some sites to use recreational vehicles as makeshift shelters in an effort to adhere to social distancing recommendations (North, 2020). Finally, while shelters have remained open, they rely on now-closed institutions like judicial courts to conduct much of their legal advocacy work. Together, these circumstances represent dangerous, often tragic, public health emergencies that disproportionately affect women. Furthermore, the effect of the Covid-19 pandemic and response warrants heightened vigilance for the healthcare workforce to detect IPV, advocate for survivors, and incorporate IPV protections into emergency response planning.

6. Psychological response to stress

Threatened and actual experiences of harm present challenges to mental health for survivors of Covid-19 infection, healthcare workers, and community members alike. During the SARS (2003), Ebola (2014), and Zika (2016) outbreaks, survivors of the illness experienced isolation, threat to life, stigma, and guilt as well as neuropsychiatric sequelae of the primary viral disease and treatment (Mak et al., 2009; Tucci et al., 2017). Healthcare workers during the SARS and Ebola outbreaks experienced unique stressors related to working on the front lines, including increased occupational risk of infection, job stress, and fear of transmitting the disease to loved ones (Tucci et al., 2017; Wu et al., 2009). Community members experienced distress related to media messaging, resource insecurity, distrust of the healthcare system, trauma from the illness or death of others, isolation, burden of caregiving, and fear of infection (Tucci et al., 2017; Shultz et al., 2015; Vetter et al., 2016). Subsequent studies demonstrated that outbreak-specific stressors resulted in poorer mental health outcomes for all groups, with increased rates of sleep disturbance, post-traumatic stress disorder (PTSD), depression, and anxiety in the short and long term (Mak et al., 2009; Tucci et al., 2017; Wu et al., 2009; Vetter et al., 2016). While these risk factors can affect the mental health of all populations during the Covid-19 pandemic, there is likely a differential impact on women.

Previous work suggests that gendered differences in mental health disorders outside of the disease outbreaks exist largely due to structurally imposed strains on women (Afifi, 2007), with disproportionate impacts on Black, Latinx, Native, and immigrant populations, partially due to discrimination (American Psychiatric Association, 2007; Greenwood et al., 2017). Gendered social roles and power differentials contribute to increased risk of chronic stress and loss of agency (Afifi, 2007; World Health Organization [WHO], 2002; Williams and Kurina, 2002; Thomas, 1997). Sociological research on women's social roles hypothesize several sources of chronic stress: empathic vicarious stress, lack of social support, workforce participation, parenthood, and caregiving responsibilities (Williams and Kurina, 2002; Thomas, 1997). Follow-up studies demonstrate that greater dissatisfaction with social roles correlates with increased levels of stress in women (Thomas, 1997; Sumra and Schillaci, 2015).

The unique experience of stress that women encounter at baseline contributes to a higher prevalence of mental health disorders, including depression, anxiety, and PTSD (Afifi, 2007). Among people with substance use disorders, women often have faster progression to addiction and are more likely to have co-occurring mental disorders than men, supporting the theory that substance use serves as a coping mechanism for many women (McHugh et al., 2014). Despite greater utilization of mental health resources, women in the US are twice as likely to have unmet needs for mental health services as men, often because of inadequate insurance coverage and stigma associated with seeking care (US Department of Health and Human Services, 2010).

Although literature regarding gender disparities in mental health during disease outbreaks is limited, the above-mentioned gender differences in stress experience and exposure are likely exacerbated by pandemics. Gender roles tend to be reinforced during times of disease outbreak (Smith, 2019; Davies and Bennett, 2016). This likely increases feelings of stress, dissatisfaction, and lack of autonomy among women as they try to reconcile their self-identity with their imposed roles. Therefore, when insults to mental wellbeing occur, they are added to women's baseline stress and feelings of disempowerment, increasing the risk of mental health disorders.

Women disproportionately shoulder factors (e.g., social isolation, caregiving roles, resource insecurity) demonstrated in past pandemics to increase the risk of mental health disorders. A multinational survey found that women without social support are more vulnerable to negative mental health outcomes than men without social connections, due to women's greater reliance on social support (Dalgard et al., 2006). Because women cannot access previously cultivated supportive relationships during Covid-19 due to social distancing, they may feel the effects of isolation more acutely.

Some of the behavior changes motivated by the stress of this pandemic may prove beneficial to women, however. A May 2020 survey conducted by the CDC demonstrated that although men and women largely had similar beliefs and behaviors regarding public health measures, a greater proportion of women reported avoiding public places and wearing face coverings while in public (Czeisler et al., 2020). Other surveys conducted in the US show that a higher proportion of women than men self-report adherence to public health measures including avoiding social gatherings and travel, engaging in frequent hand hygiene, and stockpiling of food and medications (Frederiksen et al., 2020; Park et al., 2020). Stricter adherence to social distancing guidelines and avoidance of risky behaviors may be protective for SARS-CoV-2-related disease and death for women.

In the 2003 SARS outbreak, female healthcare workers were at higher risk of psychiatric morbidity (OR = 1.58, 95% CI 1.07–2.33) (Chong et al., 2004) than their male counterparts due to their caregiving role (Chong et al., 2004; Tam et al., 2004). Similarly, in the Covid-19 pandemic, the high proportion of female healthcare workers makes these women at occupational risk of poor mental health outcomes. The Covid-19 pandemic also presents a perfect storm for female informal caregivers to experience increased burden, as mentioned above, which has demonstrated negative outcomes such as poor self-care, depression, and anxiety (Adelman et al., 2014). Furthermore, this pandemic has incited a rapid economic downturn, severely affecting industries with high proportions of female employees (i.e., hospitality, travel, food service, education) (Alon et al., 2020). Limited access to healthcare resources during the Covid-19 pandemic affects non-white, immigrant,

and low-income women in particular, who are less likely to have adequate health insurance and financial resources (Alon et al., 2020). These issues will both contribute to the development of mental health disorders and limit access to mental health resources for women during and after the pandemic.

The disparate impacts of stressors among genders during the Covid-19 pandemic are already being seen. A study of the Hubei Province in China showed that women endorsed significantly more post-traumatic stress symptoms than men in the aftermath of the Covid-19 outbreak (Liu et al., 2020). Fig. 2 shows the results of a KFF survey from March 2020 in which women in the US expressed significantly more concern than men about risks of Covid-19 exposure, lost income, and overwhelming treatment costs (Frederiksen et al., 2020). More women also reported poor mental health than men (Fig. 2) (Frederiksen et al., 2020). A study of US individuals' stress and coping during the Covid-19 pandemic showed similar results, with women experiencing more stress-inducing events and reporting more severe stress than men (Park et al., 2020). Among pregnant women, anxiety related to Covid-19 is widespread. A survey of pregnant women in May 2020 showed that the prevalence of anxiety was 78.9%, with 21.7% of those surveyed experiencing severe anxiety (Preis et al., 2020). High risk pregnancy (aOR 1.52, 95% CI 1.06–2.19), abuse history (aOR 1.85, 95% CI 1.24–2.75), and pandemic-related stress surrounding birth preparedness (aOR 1.75, 95% CI 1.35–2.26) and SARS-CoV-2 infection (aOR 1.55, 95% CI 1.28–1.88), were predictive of higher levels of anxiety (Preis et al., 2020). It remains to be seen whether long-term mental health effects will persist after the Covid-19 pandemic, but these too will likely be influenced by gender.

7. Discussion

During disease outbreaks, "gender blindness"—the systemic failure to acknowledge gender differences in health—pervades and hinders response efforts (Smith, 2019). Although actions by government and health organizations toward preparedness planning and relief are ongoing, these efforts exclude investigating and mitigating the unique effects that pandemics impose on women. The only published CDC recommendations on women's health during the pandemic to date are related to obstetric care (CDC, 2020b), failing to acknowledge other gender-specific health effects. Notably, the Coronavirus Aid, Relief, and Economic Security (CARES) Act has no provisions accounting for the differing effects of Covid-19 on various genders (CARES Act, 2020). Omitting gender analysis from public health research, interventions, and policy development fails to acknowledge the gendered impacts of disease outbreaks on healthcare access and utilization, labor practices, healthcare financing, data collection, and program evaluation. Gender blindness leads to health interventions that may be less effective for women at best and directly harmful to their wellbeing at worst—outcomes demonstrated in previous disease outbreaks (Smith, 2019; Davies and Bennett, 2016).

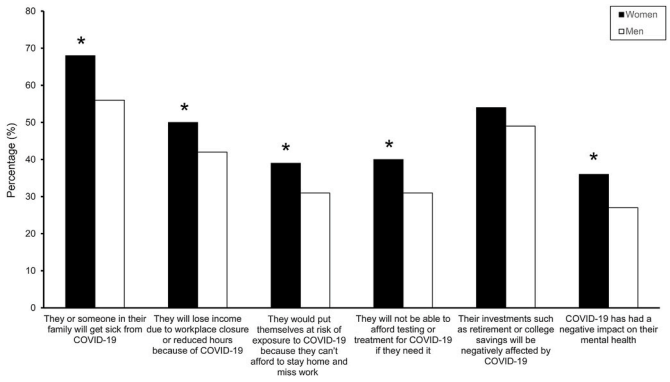

Fig. 2. Percent of respondents who report stress for various health, economic, and social outcomes related to the Covid-19 pandemic. Total number of respondents, n, equals 1216, with 620 women and 596 men. Asterisks indicate statistical significance, $p < .05$. Adapted from Kaiser Family Foundation Coronavirus Poll from March 2020 (Frederiksen et al., 2020).

The response to Covid-19 requires a paradigm shift in healthcare delivery and policy, fostering interventions that account for the differing effects of pandemics on different genders. Workforce planning should account for the gendered occupational risk of Covid-19 infection and mental health disorders given the overrepresentation of women as caregivers in the US. In the immediate response, physical and financial access to childcare and mental health services should be ensured for caregivers, including those outside of formal healthcare roles. Telehealth services, direct-to-consumer online markets, and insurance coverage should be expanded to enable remote prescribing of contraception and medical abortions, options already available in parts of the US (Gill and Norman, 2018). Anticipatory stockpiling of contraception should be added to emergency preparedness plans. Development of novel vaccines and therapies should include pregnant and breastfeeding people. Emergency aid should be gender-budgeted as proposed by the WHO, accounting for existing economic gender disparities and the differing effects of the pandemic on women's SES (Payne, 2009).

In the recovery phase after the pandemic, gender should be considered when setting agendas and allocating resources. The healthcare workforce should be adequately trained and staffed to address the increased demand for critical services—including obstetrics, family planning, therapy, and social work—after the pandemic. Healthcare providers, especially primary care providers, should screen for Covid-19-related trauma in addition to depression and anxiety. Providers should be prepared to address the mental health consequences of Covid-19, acknowledging the structural influences that disproportionately impact women. Throughout the outbreak planning and response periods, institutions must engage stakeholders most affected by Covid-19 policies in the decision-making process, centering the concerns of women, especially those from marginalized populations. In these ways, leaders and healthcare providers can respond more effectively to disease outbreaks.

Due to the evolving nature of this pandemic, data regarding gendered health differences during Covid-19 are limited. Much of the literature cited here regarding gender and disease outbreaks come from the SARS, Ebola, and Zika outbreaks. Although these outbreaks affected women in the US, most of the literature is written from a global perspective, which reduces its generalizability to a US context.

While this article addresses topics related to women's health, we acknowledge that manifestations of systemic oppression in society affects all genders. Additionally, the current body of knowledge overwhelmingly focuses on differences among genders that are detrimental to women. There may be aspects of women's experiences during the Covid-19 pandemic and other disease outbreaks that are beneficial to women's health, but our discussion of those topics is limited by the negativity bias of reporting in the literature. Future research may elucidate many of the protective effects that women's gender has on their experiences during this pandemic. Furthermore, we recognize that gender is often framed through a lens of ethnocentrism, classism, and heteronormativity, which limits our description of the literature. Many gendered health disparities can be attributable to pervasive ideologies and behaviors that manifest in historically-rooted systems regulating the identity and expression of cisgender, transgender, and gender-diverse individuals. As such, any efforts at alleviating these disparities must address underlying social norms and structures, which is beyond the scope of our review.

The Covid-19 pandemic amplifies existing gender health disparities in the US, and its impacts are felt acutely among women most vulnerable to poverty, housing insecurity, IPV, incarceration, racism, and other sources of inequity. The pandemic will have immediate and long-term effects on women's health, highlighting the importance of gender

analysis in its planning and response. When preparing for the aftermath of Covid-19, healthcare providers and administrators should take a gender-inclusive approach to developing screening guidelines, instituting treatment plans, and delivering patient care. Particularly during disease outbreaks, when normal processes may be forgone in order to act expeditiously, intersectional gender analyses are integral to addressing issues that arise and mitigating the exacerbation of inequities.

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